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Efficacy of Foliar Fungicides and Application Timing of Stratego YLD on Field Corn in Nebraska, 2013

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CORN (*Zea mays* L. NK 'N68B')
Gray leaf spot; *Cercospora zeae-maydis*

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A foliar fungicide efficacy timing trial was conducted at the University of Nebraska-Lincoln South Central Agricultural Laboratory near Clay Center, NE. Corn hybrid NK 'N68B', rating of "fair" (7 out of 9) for gray leaf spot (GLS), not rated for common rust (CR), and "excellent" (2 out of 9) for southern rust (SR), was planted on 15 May in 30-in. rows at a target population of 31,763 plants/A. The trial area was disked with corn as the previous year's crop. Nine treatments and a non-treated control were replicated six times in a randomized complete block design. Each plot was four rows (10 ft) wide by 40 ft in length. Foliar fungicides were applied with a modified high-clearance sprayer. The 10 ft spray boom consisted of six nozzles (TeeJet XR11002) spaced 20-in. apart and 18-in. above the canopy. Each treatment was applied at 40 psi traveling at 3.0 mph resulting in a 20 gal/A application volume. Foliar fungicides were applied on 13 Jun at growth stage V4, 26 Jun at growth stage V7, 11 Jul at growth stage V11, and 25 Jul at reproductive stage R1. Although foliar disease was observed at very low severity levels throughout the growing season, GLS, CR, and SR severity was visually assessed by estimating percent leaf area covered with lesions over the entire plot on 13 Jun (V4), 26 Jun (V7), 11 Jul (V11), 25 Jul (R1), 22 Aug (R4) and 4 Sep (R5.33), and these data were used to calculate area under the disease progress curve (AUDPC). Stay green was visually assessed on 30 Sep (R6) as the average percentage of green leaf material remaining on the plant in each plot. Corn lodging was assessed on 16 Oct (R6) as the percentage of corn stalks lodged below the ear from 20 stalks pushed from the standing 12 o'clock position to the 2 o'clock position (45^{o} angle). Grain was mechanically harvested with a two-row research combine on 22 Oct. The ends of plots were trimmed prior to harvest and the harvested area of each plot was measured prior to harvest and used to calculate yield. All assessments (disease severity, stay green, and yield) were completed in the two center rows of each plot, except push lodging was done in rows one and four. Monthly rainfall and temperatures were relatively normal during the growing season. High temperatures ranged from the mid-60's (^{o}F) to mid-80's (^{o}F) at the time of the R1 application and during the R1 growth stage. Average monthly high temperatures for Jul and Aug were in the mid 80's (^{o}F). A hail event occurred on 1 Aug when the corn was at the end of the R1reproductive stage which caused an estimated 35% defoliation. The research farm did receive precipitation throughout much of the growing season and any needed supplemental water was added by an overhead sprinkler linear irrigation system. All trial data was analyzed in SAS using the Waller-Duncan K-ratio t Test at the P=0.05 significance level.

Common rust was the initial foliar disease observed in this trial, first seen on the 11 Jul assessment date. Southern rust was only observed on 4 Sep. Both common rust and southern rust severity were at trace levels (0.1%) at the initial rating and throughout the growing season. Gray leaf spot was identified in this trial on 22 Aug in trace amounts and severity did not exceed 0.3% for any treatment on any assessment date. Gray leaf spot lesions were identified on the ear leaf by the 4 Sep assessment date. There were significant differences among treatments for GLS AUDPC. Foliar fungicide treatments applied at later growth stages tended to exhibit lower GLS AUDPC among treatments. There were significant differences among treatments for stay green as percentages ranged from 39.6 % to 48.6%. There were significant differences among treatments for percent lodging ranged from 0.8% to 7.5%. Five hundred-count kernel weights ranged from 5.43 oz to 5.56 oz. Grain moisture at harvest ranged from 16.5% to 17.0%. Yields for fungicide treatments ranged from 201.9 bu/A for Stratego YLD 4.18 SC, 2 fl oz/A, V4 to 216.9 bu/A for Stratego YLD 4.18 SC, 4 fl oz/A, V11. The non-treated control had a yield of 206.8 bu/A. There were significant differences among treatments for yield.

Treatment, rate/A, timing	GLS AUDPC[z]	Stay green (%)[y]	Lodging (%)[x]	500 kernel weight (oz)	Grain moisture %	Dry yield (bu/A)[w]
Non-treated control…….....	3.2 bc[v]	43.1 ab	1.7 b	5.5	17.0	206.8 ab
Stratego YLD 4.18 SC[u], 2 fl oz, V4….....	3.4 ab	41.7 ab	5.8 ab	5.5	16.6	201.9 b
Stratego YLD 4.18 SC[u], 4 fl oz, V4….....	3.9 a	42.4 ab	4.2 ab	5.5	16.7	208.5 ab
Stratego YLD 4.18 SC[u], 2 fl oz, V7….....	2.9 bc	43.1 ab	1.7 b	5.6	16.9	208.1 ab
Stratego YLD 4.18 SC[u], 4 fl oz, V7….....	2.7 c	44.4 ab	2.5 ab	5.5	16.6	208.6 ab
Stratego YLD 4.18 SC, 4 fl oz, V11….....	2.7 c	39.6 b	7.5 a	5.5	16.8	216.9 a
Stratego YLD 4.18 SC[u], 4 fl oz, R1….....	3.0 bc	43.1 ab	5.0 ab	5.5	16.9	216.7 a
Headline AMP 1.67 SC[u], 10 fl oz, R1….....	2.7 c	45.8 ab	0.8 b	5.4	16.9	215.6 a
Priaxor 4.17 SC[u], 4 fl oz, R1…….....	2.7 c	48.6 a	1.7 b	5.5	16.5	210.0 ab
Aproach 2.08 SC[u], 6 fl oz, R1…….....	2.9 bc	41.7 ab	1.7 b	5.5	16.8	211.8 ab
Coefficient of Variation (%)	15.9	12.1	119.4	2.2	3.3	3.7

[z]Area under the disease progress curve.
[y]Stay green was estimated as the percentage of green leaves on the plant.
[x]Lodging was estimated as the percentage of corn stalks lodged below the ear from 20 stalks pushed to arm's length.
[w]Yield calculations adjusted to a moisture content of 15.5%.
[v]Data followed by the same letter or without letters within a column are not statistically different (P > 0.05) according to the Waller-Duncan k-ratio t Test.
[u]Treatment included a non-ionic surfactant, 0.25% V/V